DATA REVIEW FOR DERMAL SENSITIZATION TESTING (81-6, 870.2600)

Product Manager: Marshall Swindell
MRID No.: 48377509

Reviewer: Chris Jiang
Study Completion Date: Nov. 16, 2010
Report No.: 14315-10

Testing Laboratory: Stillmeadow Incorporated
Author: Janice O. Kuhn

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Positive Control: α-Hexylcinnamaldehyde (HCA)

Species: Hartley guinea pig
Weight on day 0: ♂: 345 g to 400 g, ♀: 344 g to 383 g
Age: Six weeks at first induction
Source: Charles River, Hdq., Wilmington, MA

Method: Buehler Method

Summary:

1. **This Product is not a dermal sensitizer.**
2. **Classification**: Acceptable

Procedure (Deviation From §81-6): Relative humidity was at times out of the range specified in the protocol. This deviation had no impact on the integrity of the study.

Procedure: After preliminary tests, the definitive study was undertaken. Once each week for three weeks, either 0.4 mL of the undiluted test material or nothing was applied to the clipped left front quadrant using gauze patches. After chamber application, the trunks of the animals were wrapped with elastic wrap which was secured with adhesive tape. After the exposure period, the chambers and bindings were removed and the test sites were cleansed of residual test substance. The guinea pigs were scored at 24 and at 48 hours after each induction.
Two weeks after the third induction, all animals were challenged with 0.4 mL of the undiluted test substance on the right rear quadrant. The guinea pigs were scored at 24 and at 48 hours after challenge.

Results: At 24 hours and at 48 hours after each induction and at 24 hours and at 48 hours after challenge, there was no sensitization response.

The historical positive control showed appropriate results.

DATA REVIEW FOR ACUTE ORAL TOXICITY TESTING (81-1, 870.1100)

Product Manager: Marshall Swindell
MRID No.: 48377504

Reviewer: Chris Jiang
Study Completion Date: Nov. 16, 2010
Report No.: 14310-10

Testing Laboratory: Stillmeadow Incorporated
Author: Janice O. Kuhn

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Dosage: 5000 mg/kg

Species: Three female albino Sprague-Dawley rats
Age: Eight weeks at time of dosing
Weight: 171-191 grams (fasted)
Source: Texas Animal Specialties, Humble, TX

Conclusions:

1. **LD_{50} (mg/kg):** $LD_{50} > 5000$ mg/kg
2. **The estimated LD_{50} is greater than 5000 mg/kg.**
3. **Toxicity Category**: IV **Classification**: Acceptable

Procedure (Deviations from 81-1): The Up-and-Down Procedure was used. This deviation had no impact on the integrity of the study.

Results:

Reported Mortality

Animal Number	Dosage (mg/kg)	Outcome
71	5000	O
72	5000	O
73	5000	O

O = lived, **X** = died

Observations: All animals appeared normal and healthy for the duration of the study.

Gross Necropsy Findings: Gross necropsies were unremarkable.

DATA REVIEW FOR ACUTE INHALATION TOXICITY (§81-3, 870.1300)

Product Manager: Marshall Swindell
MRID No.: 48377506

Reviewer: Chris Jiang
Study Completion Date: Nov. 5, 2010
Report No.: 14312-10

Testing Laboratory: Stillmeadow Incorporated
Author: Andrew Doig

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Dosage: 2.16 mg/L
(Nominal concentration: 23.5 mg/L) (Gravimetric concentration: 2.16 mg/L)

Species: Five male and five female albino Sprague-Dawley rats
Age: Eight weeks at time of dosing
Weight: ♀: 242 to 286 grams; ♂: 157 to 193 grams
Source: Texas Animal Specialties, Humble, TX

Summary:

1. **LC_{50} (mg/L)** : > 2.16 mg/L
2. **The LC_{50} is greater than 2.16 mg/L.**
3. **MMAD**: 2.4 µm
4. **Toxicity Category**: IV **Classification**: Acceptable

Procedure (Deviations from 81-3): No deviations occurred during the study.

Results:

Reported Mortality

Dosage (mg/L)	(Number Deaths/Number Tested)		
	Males	Females	Combined
2.16	1/5	2/5	3/10

Chamber Atmosphere			
Dose Level (mg/L)	MMAD (µm)	GSD (µm)	particles < 3.2 µm
2.16	2.7	6.3	11.84
2.16	2.1	8.0	7.69

Chamber Environment During Exposure

Chamber Volume (L)	500
Average Total Airflow Volume (Lpm)	218
Air Changes Per Hour	26.2
Mean Temperature (°C)	23
Mean Relative Humidity (%)	61

Clinical Observations:

Clinical observations of the males included very slight to moderate piloerection, very slight to extreme hypoactivity, respiratory gurgle, and weight loss. Two males died. Clinical observations of the females included very slight to moderate piloerection, very slight to moderate hypoactivity, respiratory gurgle, and weight loss. One female died.

Gross Necropsy Findings:

Gross necropsy of all males revealed the stomach full of gas. The necropsy of the decedent also showed a red crust around the eyes and muzzle and a dark red liver.

Gross necropsy of all surviving females revealed the stomach full of gas. Gross necropsy of the decedent females displayed dark livers, an empty stomach and intestines, a stomach full of gas, and a red liquid on muzzle.

DATA REVIEW FOR ACUTE DERMAL TOXICITY TESTING (81-2, 870.1200)

Product Manager: Marshall Swindell
MRID No.: 48377505
Reviewer: Chris Jiang
Study Completion Date: Nov. 3, 2010
Report No.: 14311-10
Testing Laboratory: Stillmeadow Incorporated
Author: Janice O. Kuhn

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Dosage: 5050 mg/kg

Species: Five male and five female albino Sprague-Dawley rats
Age: Eight weeks at time of dosing
Weight: ♀: 177 to 192 grams before dosing; ♂: 257 to 308 grams before dosing
Source: Texas Animal Specialties, Humble, TX

Conclusions:

1. **LD_{50} (mg/kg):** $LD_{50} > 5050$ mg/kg
2. **The estimated LD_{50} is greater than 5050 mg/kg.**
3. **Toxicity Category**: IV **Classification**: Acceptable

Procedure (Deviations from 81-2): No deviations occurred during the study.

Results:

Reported Mortality

Dosage (mg/kg)	(Number Deaths/Number Tested)		
	Males	Females	Combined
5050	0/5	0/5	0/10

Observations: All animals appeared normal and healthy for the duration of the study.

Gross Necropsy Findings: Gross necropsies were unremarkable.

DATA REVIEW FOR PRIMARY EYE IRRITATION TESTING (81-4, 870.2400)

Product Manager: Marshall Swindell
MRID No.: 48377507

Reviewer: Chris Jiang
Study Completion Date: Oct. 28, 2010
Report No.: 14313-10

Testing Laboratory: Stillmeadow Incorporated
Author: Janice O. Kuhn

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Dosage: 0.1 mL

Species: One male and two female albino New Zealand White rabbits
Age: Sixteen weeks at time of dosing
Initial Weight: 3.050 to 3.450 kg
Source: Myrtle's Rabbitry, Thompsons Station, TN

Summary:

1. **Toxicity Category**: II
2. **Classification**: Acceptable

Procedure (Deviations from 81-4): The relative humidity was outside of the range specified in the protocol. This deviation had no impact on the integrity of the study.

Results:

Individual Scores for Ocular Irritation

Observations	Rabbit No. 5228 (Male)						
	Hours After Treatment						
	1	24	48	72	94	168	360
I. Corneal Opacity	0	1*	+*	+*	+*	+*	0
II. Iritis	0	0	0	0	0	0	0
III. Conjunctivae							
A. Redness	1	2	1	0	0	0	0
B. Chemosis	1	2	1	0	0	0	0
C. Discharge	2	3	2	1	1	1	0
Observations	Rabbit No. 5249 (Female)						
	Hours After Treatment						
	1	24	48	72	94	168	360
I. Corneal Opacity	0	1*	1*	1*	1*	+*	0
II. Iritis	0	0	0	0	0	0	0
III. Conjunctivae							
A. Redness	1	2	2	2	2	2	0
B. Chemosis	1	3	2	1	1	1	0
C. Discharge	1	3	2s	2	2	1	0
Observations	Rabbit No. 5215 (Female)						
	Hours After Treatment						
	1	24	48	72	94	168	360
I. Corneal Opacity	0	1*	1*	1*	1*	1*	0
II. Iritis	0	0	0	0	0	0	0
III. Conjunctivae							
A. Redness	1	3	2	2	2	1	0
B. Chemosis	1	3	2	1	1	1	0
C. Discharge	2	3	2	1	1	1	0

* - Flourescein staining used

+ - Slight dulling of normal luster

s – red discharge

DATA REVIEW FOR PRIMARY SKIN IRRITATION TESTING (81-5, 870.2500)

Product Manager: Marshall Swindell
MRID No.: 48377508

Reviewer: Chris Jiang
Study Completion Date: Oct. 8, 2010
Report No.: 14314-10

Testing Laboratory: Stillmeadow Incorporated
Author: Janice O. Kuhn

Quality Assurance (40 CFR 160.12): A statement of GLP compliance was included.

Test Material: Cavicide 1, lot 10-1201, clear liquid
Dosage: 0.5 mL

Species: Two male and one female albino New Zealand White rabbits
Age: Sixteen weeks at time of dosing
Initial Weight: 3.000 to 3.250 kg
Source: Myrtle's Rabbitry, Thompsons Station, TN

Conclusions:

1. **Toxicity Category**: IV
2. **Classification**: Acceptable

Procedure (Deviations from 81-5): The relative humidity was outside of the range specified in the protocol. This deviation had no impact on the integrity of the study.

Results:

Animal number	Erythema/edema after unwrap			
	1	24	48	72
5238-M	1/0	0/0	0/0	0/0
5240-M	1/0	0/0	0/0	0/0
5239-F	1/0	0/0	0/0	0/0